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Notice of Allowability	Application No.	Applicant(s)	
	10/765,973	BLACK, JOHN D.	
	Examiner	Art Unit	
	Stephen J. Cherry	2863	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 2-19-2004.
2. ☒ The allowed claim(s) is/are 1-28.
3. ☒ The drawings filed on 29 January 2004 are accepted by the Examiner.
4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☒ All b) ☐ Some* c) ☐ None of the:
 1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|---|--|
| 1. <input type="checkbox"/> Notice of References Cited (PTO-892) | 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6. <input type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date _____. |
| 3. <input checked="" type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date <u>2-19-2004</u> | 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 8. <input type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9. <input type="checkbox"/> Other _____. |

EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Ms. M. McCollum on 3-2-2005.

The specification is amended as follows:

Page 1, line 3, the centered heading "BACKGROUND AND SUMMARY" is inserted.

Page 3, between lines 15 and 16, the centered heading "BRIEF DESCRIPTION OF THE DRAWINGS" is inserted.

Page 3, between lines 25 and 26, the following paragraph is inserted:

--Figure 5 is an enlarged view of a means for determining the total mass flow through an engine according the present invention.--

Page 3, between lines 25 and 26, and after the paragraph added above, the centered heading "DETAILED DESCRIPTION OF EMBODIMENTS" is inserted.

Claims 1, 15 and 23 are amended as follows:

1. (Currently Amended) A method for determining the total mass flow through an engine, comprising:

_____measuring the fuel mass flow to the engine,

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_____measuring the concentration of carbon dioxide, measuring the ratio of water to oxygen, measuring the ratio of carbon dioxide to oxygen or measuring the ratio of water to carbon dioxide in the gases exhausted from the engine,

_____determining the air to fuel ratio in the engine from the fuel mass flow and the concentration of carbon dioxide, the ratio of water to oxygen, the ratio of carbon dioxide to oxygen or the ratio of water to carbon dioxide,

_____determining the air mass flow through the engine from the air to fuel ratio,
and

_____calculating the total air and fuel mass flow through the engine by adding the air mass flow through the engine to the fuel mass flow to the engine.

15. (Currently Amended) An apparatus for determining the total mass flow through an engine₁ comprising:

_____means for measuring the fuel mass flow to the engine,

_____means for measuring the concentration of carbon dioxide, means for measuring the ratio of water to oxygen, means for measuring the ratio of carbon dioxide to oxygen or means for measuring the ratio of water to carbon dioxide in the gases exhausted from the engine,

_____means for determining the air to fuel ratio in the engine from the fuel mass flow and the concentration of carbon dioxide, the ratio of water to oxygen, the ratio of carbon dioxide to oxygen or the ratio of water to carbon dioxide,

_____means for determining the air mass flow through the engine from the air to fuel ratio₁ and

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_____ means for calculating the total air and fuel mass flow through the engine by adding the air mass flow through the engine to the fuel mass flow to the engine.

23. (Currently Amended) ~~n~~An apparatus as claimed in claim 22 wherein the laser is a tunable laser.

The following is an examiner's statement of reasons for allowance:

The independent claim 1 recites "determining the air to fuel ratio in the engine from the fuel mass flow and the concentration of carbon dioxide, the ratio of water to oxygen, the ratio of carbon dioxide to oxygen or the ratio of water to carbon dioxide, determining the air mass flow through the engine from the air to fuel ratio₁ and calculating the total air and fuel mass flow through the engine by adding the air mass flow through the engine to the fuel mass flow to the engine". This feature in combination with the remaining claimed structure avoids the prior art of record.

The independent claim 15 recites "means for determining the air to fuel ratio in the engine from the fuel mass flow and the concentration of carbon dioxide, the ratio of water to oxygen, the ratio of carbon dioxide to oxygen or the ratio of water to carbon dioxide, means for determining the air mass flow through the engine from the air to fuel ratio₁ and means for calculating the total air and fuel mass flow through the engine by adding the air mass flow through the engine to the fuel mass flow to the engine". This feature in combination with the remaining claimed structure avoids the prior art of record.

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U.S. Patents 5,599,179 to Lindner et al, 6,364,602 to Andrew et al, and 6,522,994 to Lang describe similar subject matter, however, they do not disclosed the feature described above.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen J. Cherry whose telephone number is (571) 272-2272. The examiner can normally be reached on M-F 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Barlow can be reached on (571) 272-2269. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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SJC

A handwritten signature in black ink, appearing to read "J Barlow", is written over the printed name.

John Barlow
Supervisory Patent Examiner
Technology Center 2800